IN THE CLAIMS:

1. (Currently Amended) A method for controlling ~~a plant, such as~~ an industrial production plant, having a plurality of working units with controlled plant periphery generating process data during a process run-through, ~~such as industrial robots or the like,~~ using at least one programmable logic control (PLC), wherein historical process data from an actual earlier process run-through are fed into ~~the PLC~~ and processed by the PLC or another [[a]] PLC program logic in the same way as if said process data had come directly from the plant periphery.

2. (Original) The method according to claim 1, wherein feeding-in takes place in cycle-precise manner with respect to a PLC processing cycle.

3. (Original) The method according to claim 1, wherein the process data are filed in a real time data bank prior to feeding into the PLC.

4. (Currently Amended) The method according to claim 1, wherein the process data are generated [[at]] to at least one field bus of the plant.

5. (Original) The method according to claim 1, wherein during their generation, the process data are provided with a time marker.

6. (Original) The method according to claim 1, wherein there is a cyclic and/or feed-synchronous processing of the process data by the PLC.

7. (Original) The method according to claim 6, wherein processing results are made available in an output area of the PLC.

8. (Currently Amended) The method according to claim 6, wherein processing results are filed in [[the]] a real time data bank.

9. (Original) The method according to claim 8, wherein a data compression and/or a time coding takes place during filing.

10. (Currently Amended) The method according to claim 1, wherein [[the]] a process data stream to the PLC is controlled by means of a data stream controller with respect to data quantity, data rate[[,]] and time quantity ~~or the like~~.

11. (Original) The method according to claim 1, wherein the process data are fed in online or offline.

12. (Original) The method according to claim 1, wherein, as a function of software implemented in the PLC, the method is used for fault finding in the plant or PLC program, for

optimizing or simulating production sequences or for synchronous or subsequent characteristic data generation.

13. (Original) The method according to claim 1, wherein historical process data and actual process data are combined for feeding into the PLC.

14. (Original) The method according to claim 1, wherein at least two programmable logic controls form a virtual machine by cascading connection of their input areas with their output areas, optionally via further data stream control devices.

15. (Currently Amended) An apparatus for fault finding, optimization, simulation and information exchange in electronically controlled plants~~, such as industrial production plants~~, the apparatus comprising:

~~with~~ a plurality of working units~~, such as industrial robots or the like, having~~ with controlled working unit periphery generating process data during a process run-through;

a real time information server for acquiring, archiving or transferring in each case specific historical process data with respect to the plant; and

a data stream controller for the flexible transfer of archived process data to at least one programmable logic control for controlling the plant~~, whose~~ to provide output data that are again feedable into the PLC or some other PLC in the same way as if said output data was process data coming directly from the working unit periphery.

16. (Currently Amended) The apparatus according to claim 15, wherein the PLC is constructed as a software-based PLC ~~(soft PLC)~~.

17. (Original) The apparatus according to claim 15, wherein a real time data bank is provided for archiving process data.

18. (Original) The apparatus according to claim 15, wherein the data stream controller is constructed for time-precise location, for time forward and return reproduction, for accelerated and decelerated, as well as quantity-flexible reproduction of historical process data.

19. (Currently Amended) The apparatus according to claim 15, wherein a process sequence of the plant can be implemented in a time independent manner with a random sequence speed[[, e.g.]] for fault finding, sequence optimization or for training purposes.

20. (Original) The apparatus according to claim 16, wherein the historical process data are organized in accordance with their acquisition sequence in a shift register and can be read and processed at any time by an analyzer.

21. (Original) The apparatus according to claim 16, wherein the historical process data are provided with a time marker.

22. (Original) The apparatus according to claim 21, wherein a visualization unit is provided for process data analysis.

23. (Original) The apparatus according to claim 17, wherein specific process data passed on by the real time information server are available for other applications as real time data stream or object linking and embedding (OLE) for process control or analysis.

24. (Original) The apparatus according to claim 19, wherein, with respect to its program processing cycle, the PLC is synchronized with the reproduction mode of the data stream controller.

25. (Currently Amended) The apparatus according to claim 17, wherein there is at least one data acquisition unit in [[the]] a field bus system of the plant.

26. (Original) The apparatus according to claim 25, wherein the data acquisition unit is constructed for buffer storage of I/O data transferred in field bus.

27. (Original) The apparatus according to claim 26, wherein the buffer store is a shift register.

28. (Original) The apparatus according to claim 25, wherein the data acquisition unit

is connected by means of a local area network (LAN) to the real time information server.

29. (Original) The apparatus according to claim 17, wherein at least the PLC and/or the real time information server are constructed as software components of a personal computer (PC).

30. (Original) The apparatus according to claim 15, wherein a virtual machine is obtained by cascading connection of at least two programmable controls via their input and output areas, optionally via further data stream control devices.